

WARFIGHTER TRAINING RESEARCH DIVISION OVERVIEW

10 Jan 02



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Deputy Chief,
Warfighter Training Research Division
Human Effectiveness Directorate**



Outline



- **Challenges**
- **Vision**
- **Readiness Training Solution**
- **Assets**
- **Strategy**
- **Future**



Growing Training Challenges



- Resources and funding...
Aerospace, ranges, console time, mission complexity, instructor load

“Almost on any given day, the Air Force is defending itself in court against lawsuits seeking to block overflights and bombing near their communities

Gen John Handy



- Equipment and personnel...
airframe wear, system mission risk w/OJT, opstempo, perstempo
- Mission risk and security...
live weapons training, classified systems, complex ROE, environmental concern

GROWING MISSION COMPLEXITY

...modern aerospace systems employment concepts require extensive manpower, and involve large mission/system risks, requiring more composite training opportunities.



Vision

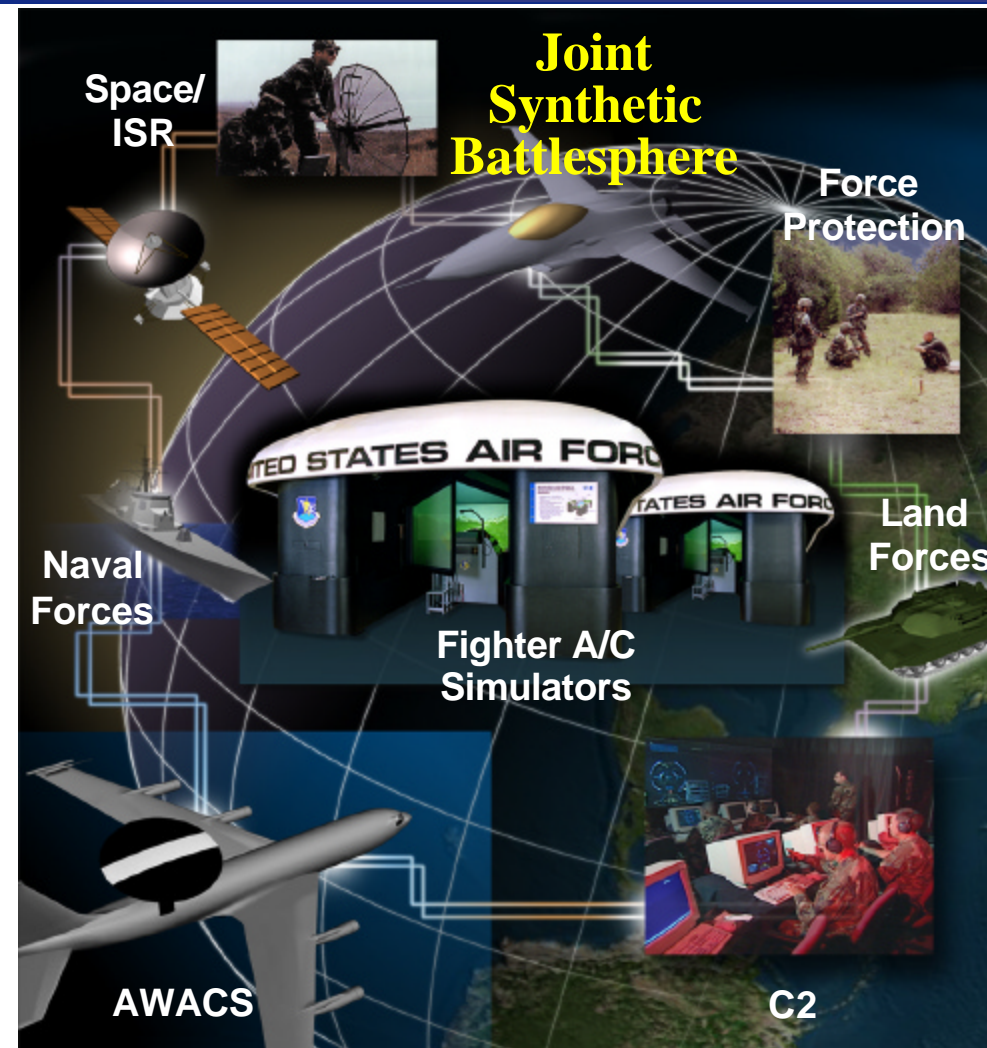


**Provide world's best training tools,
ensuring warfighters have the skills to win**





Mission



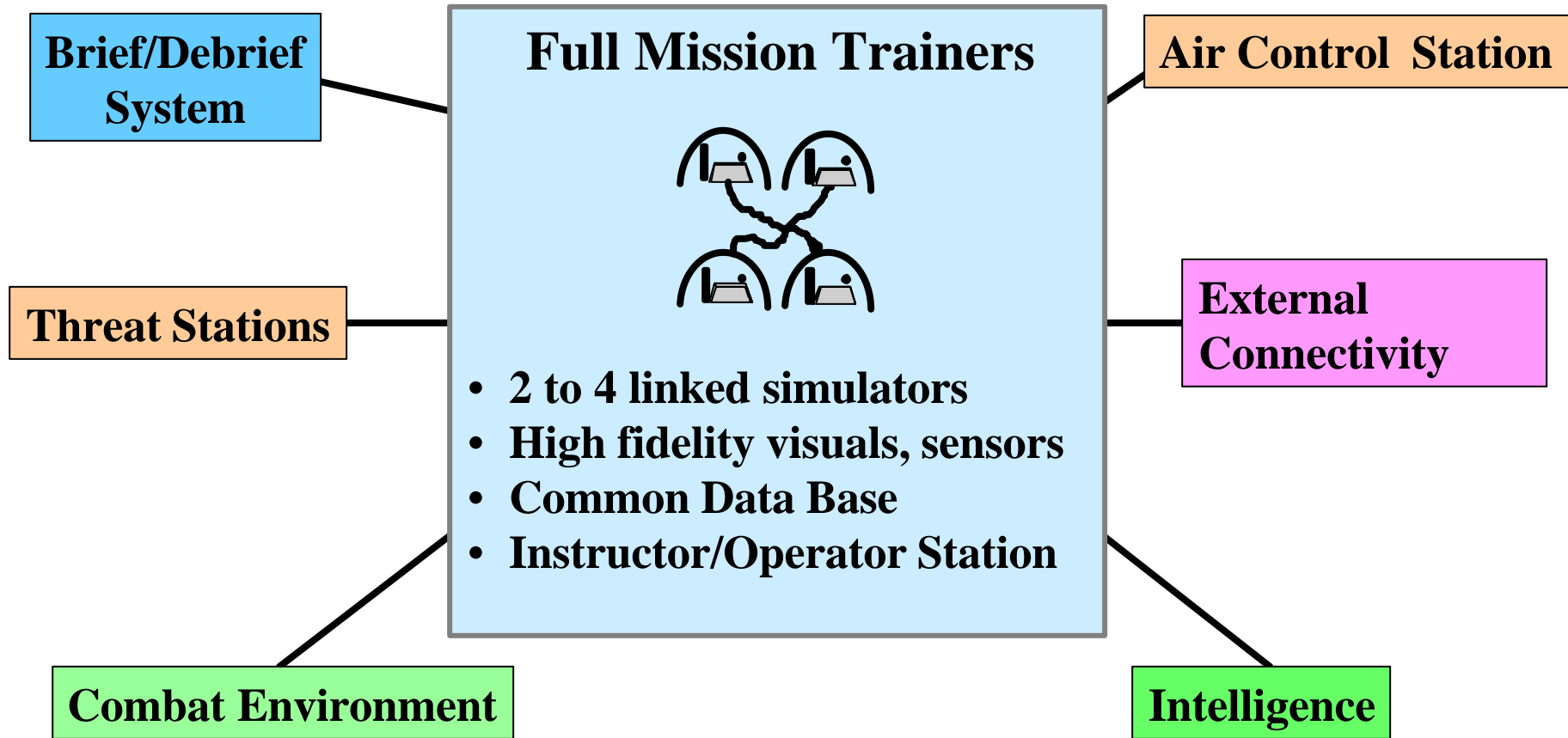
Research, develop, demonstrate, evaluate and transition leading edge technologies and methods to train warfighters, enabling the expeditionary aerospace force

“The best way to predict the future is to create it”

Peter Drucker



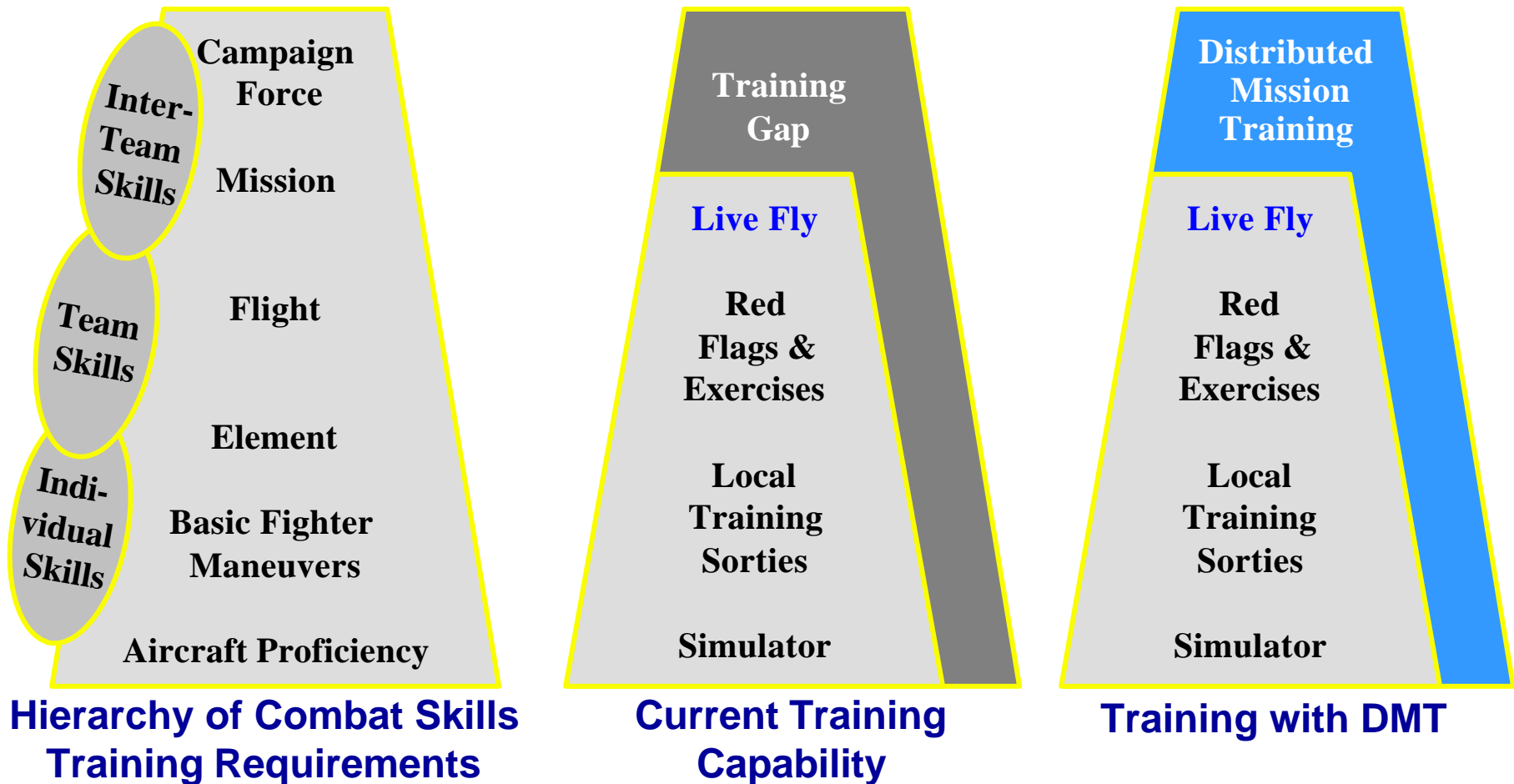
Distributed Mission Training (DMT) Readiness Training Solution



Goal: Mission Training Center (MTC) at every CAF Wing



DMT Focus – Aviation Example



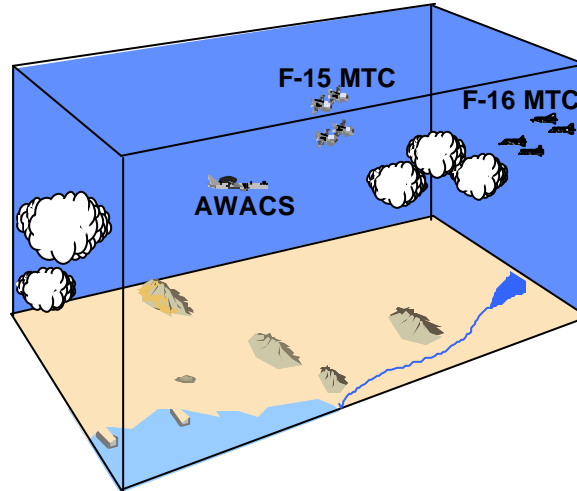
DMT focuses on the training gaps left by current flying training



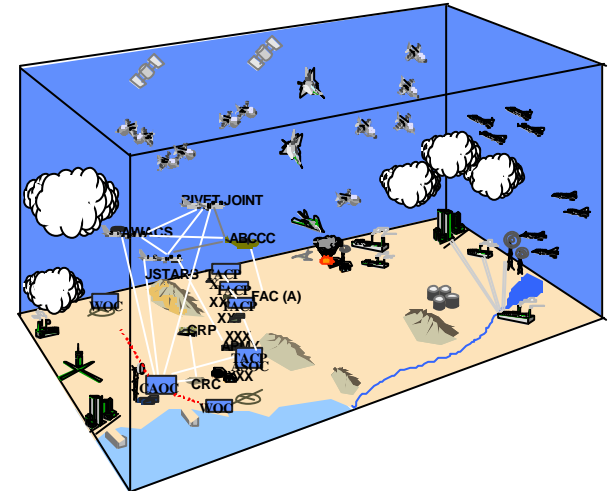
DMT Evolution



**INDIVIDUAL
TRAINING**



**TEAM
TRAINING**



**INTER-TEAM
TRAINING**

A realistic, fully integrated, scaleable
Distributed Mission Training environment
to train warfighters



DMT Combat Capability Value



MISSION TRAINING DEVELOPS SKILLS AND EXPERIENCE REQUIRED TO WIN

- **Training can be more important than hardware**
 - **Vietnam Experience**
 - **Air Force & Navy Air-to-Air Kill Ratio 2:1**
 - **After Navy initiated Top Gun--Kill Ratio 12:1**
 - **AF Developed Red Flag**

**Distributed Mission Training is Red Flag, and more
War in a Box**



Then ACC Commander Now CSAF



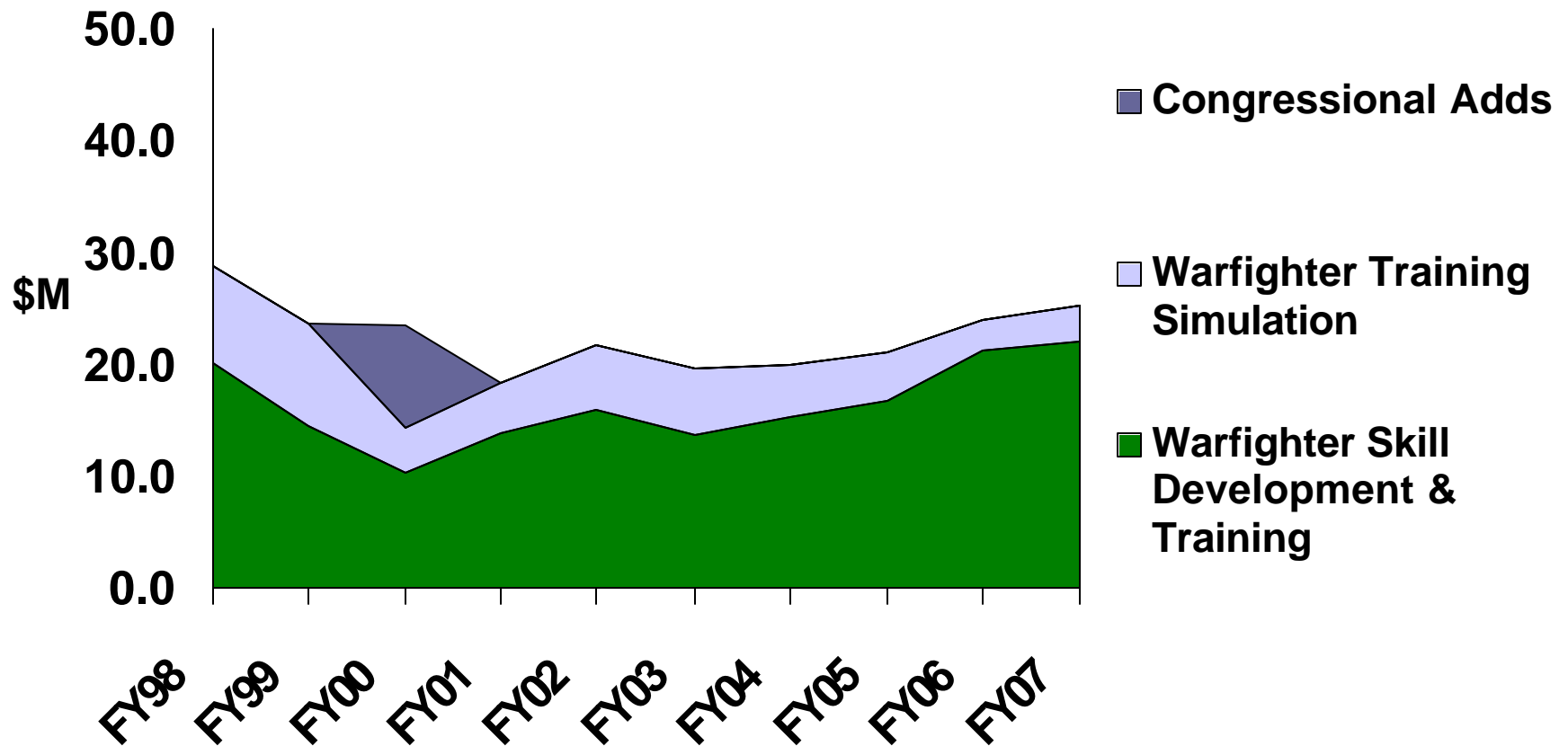
“DMT will be the only realistic way we can get intelligence, surveillance, reconnaissance (ISR) and shooters hooked up to test and train modern evolutions of tactics - like time critical targeting - that requires real time interface among platforms that are too stressed by OPTEMPO to train together in peacetime.”

**Gen John P Jumper
Commander
Air Combat Command**





Funding Baseline

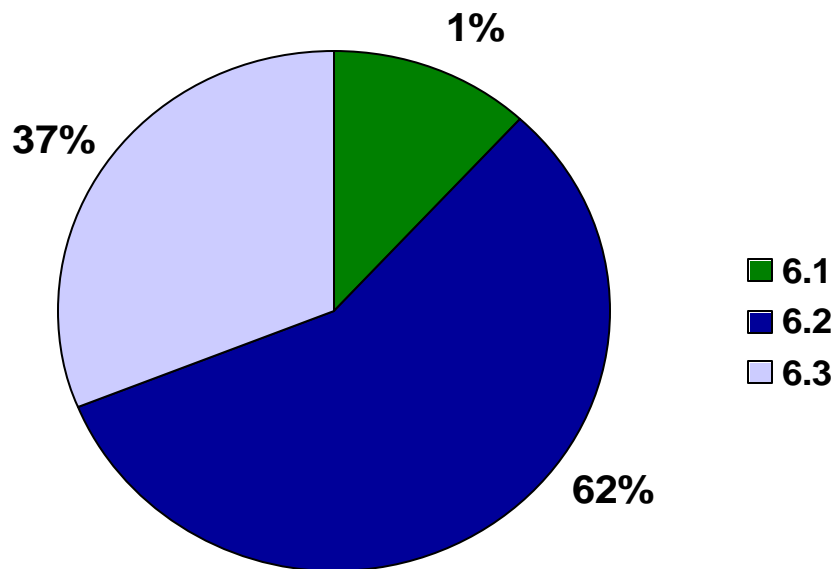




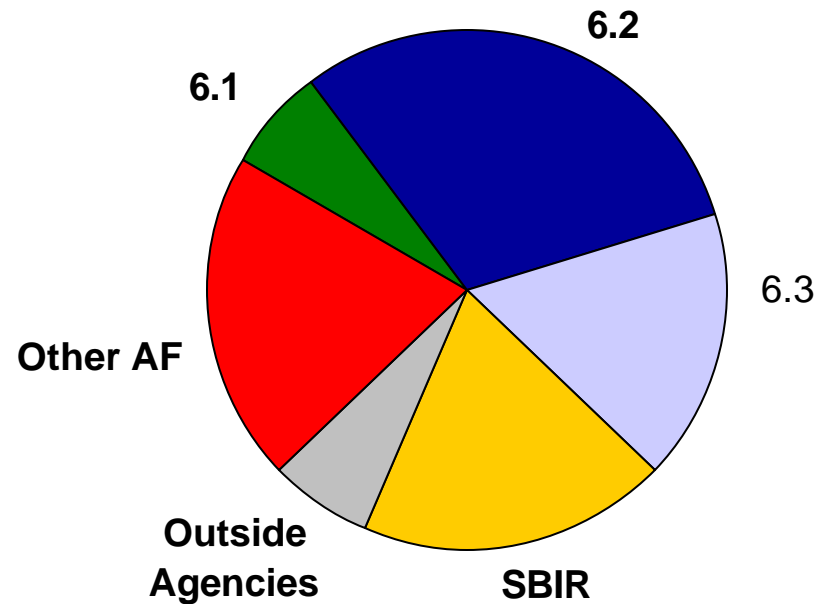
FY01 Funding



S&T Base Funding \$20.9M

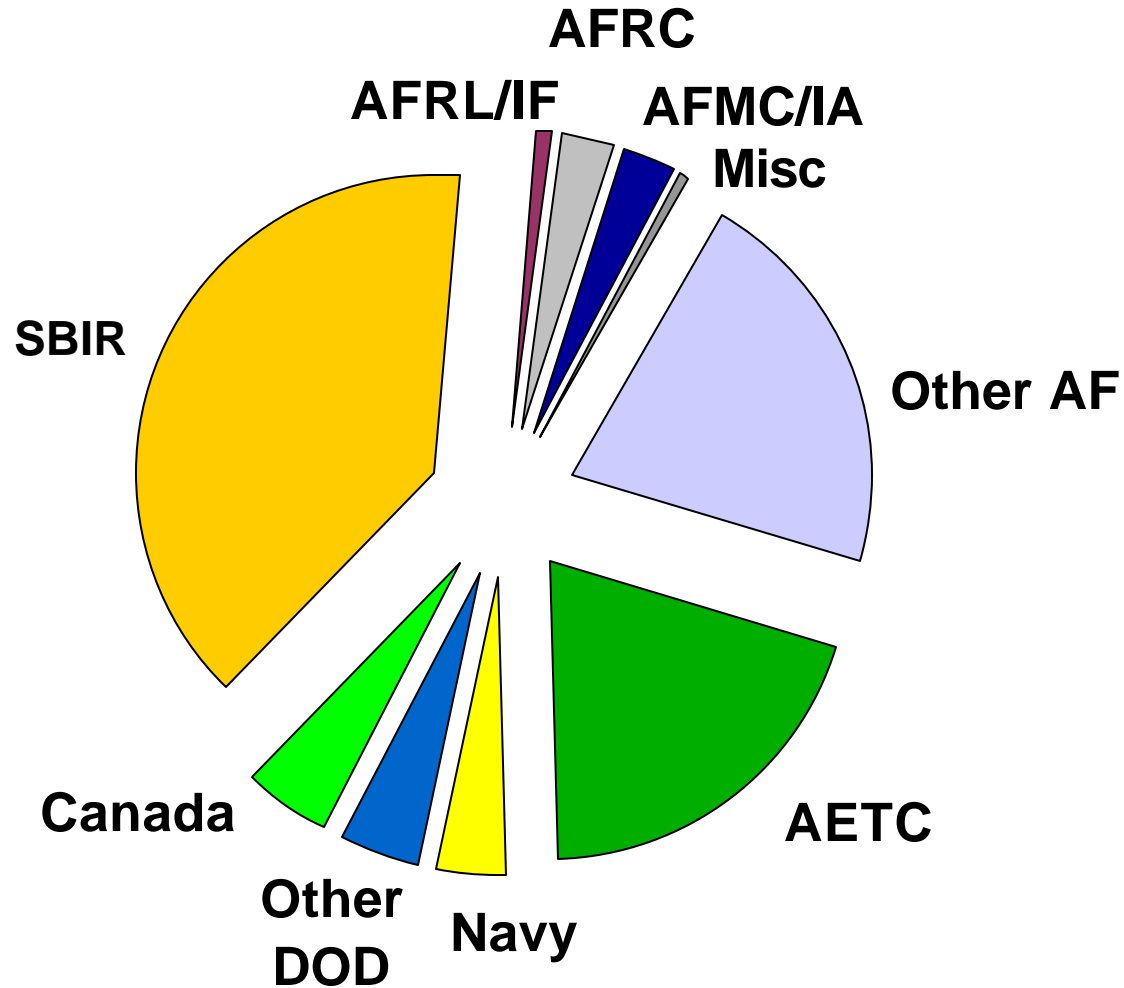


Total Thrust Funding \$38.9M





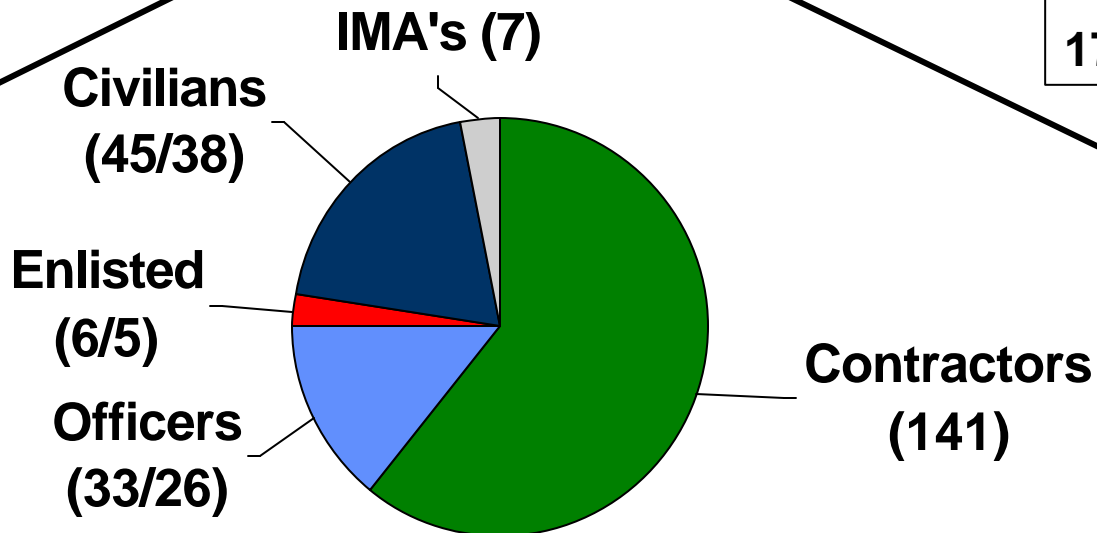
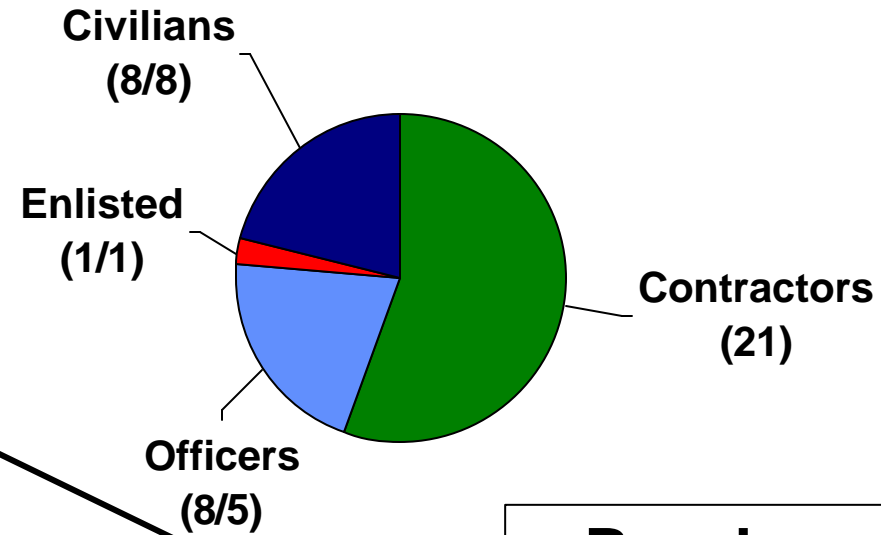
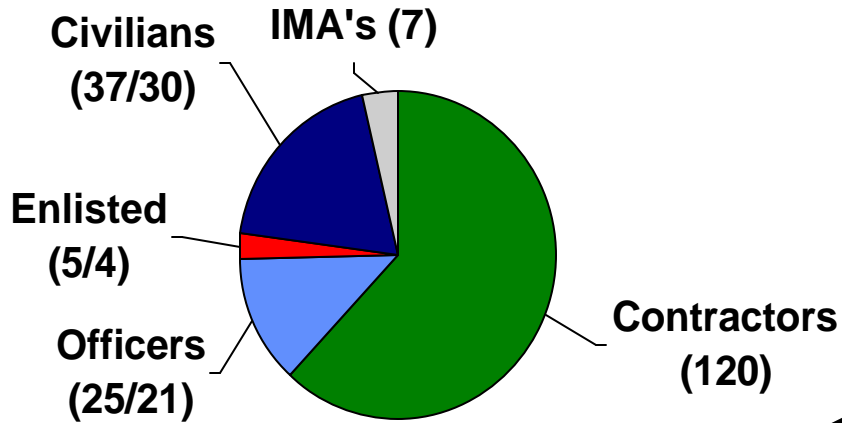
Details of Outside Funding



Total Outside Funding (FY01) = \$17,963,133



Warfighter Training Total Workforce

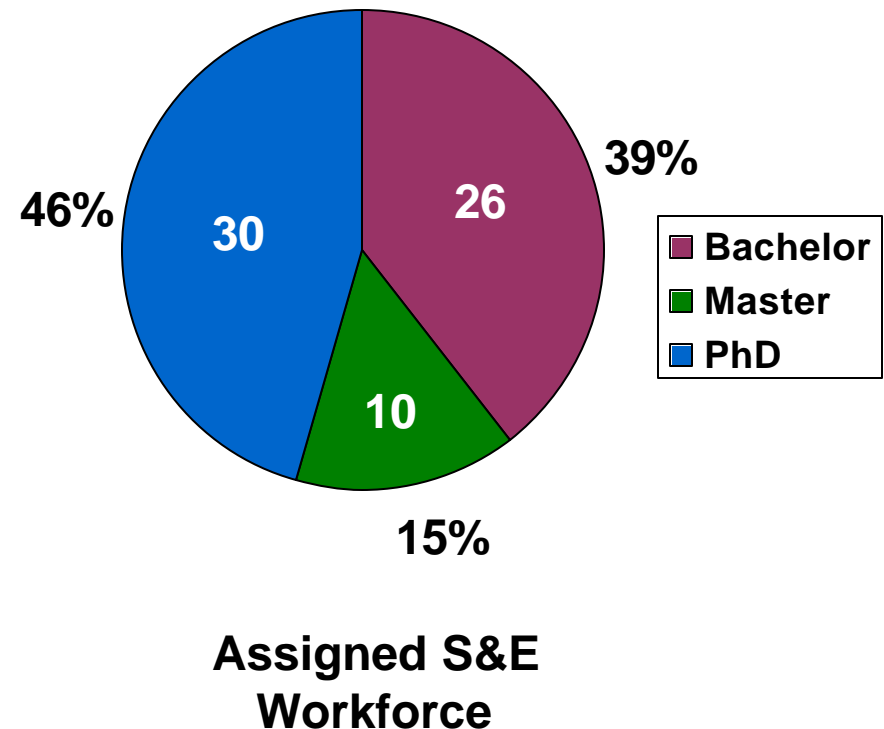




Government Disciplines



- Instructional Psychology
- Physics
- Optics
- Electronic Engineering
- Mechanical Engineering
- Physiology
- Aviators
- Operations Research
- Security Specialist
- Industrial/Organizational Psychology
- Experimental Psychology
- Cognitive Psychology
- Flight Surgeon
- Aeronautical Engineering
- Computer Science





Additional On-site Contractor Disciplines and Capabilities



- **Experimental Psychology**
- **Human Factors Engineering**
- **Operations Research**
- **Educational Psychology**
- **Aircrew Training SME**
- **Visual Perception**
- **Aeronautical Engineering**
- **Physics**
- **Computer Science**
- **Statistical Analysis**
- **Mathematics**
- **Multimedia Graphic Design**
- **Image Generation Engineering**
- **Visual Display Design and Fabrication**
- **Cockpit/IOS Design and Fabrication**
- **Software Engineering**
- **Systems Engineering**
- **Network Engineering**
- **Enterprise Data System Design and Support**



Mesa Research Site



AFMC Minor Installation

10 Buildings 97,916 GSF 6.542 acres





Warfighter Training Facilities (Brooks AFB)



Building 125



Building 170



C2TR Testbed



C3STARS Testbed



Core Competencies



- **Theory and Science of Learning and Instruction**
- **Methods for Development and Evaluation of Warfighter Training**
- **Tools and Technologies for Training for Warfighting**



Spiral Development (Research Strategy)



Operational Environments

Aircraft

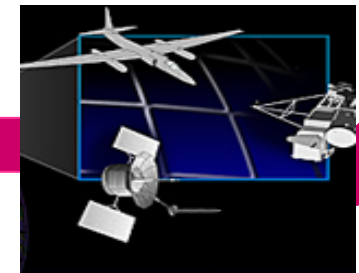
C2

ISR

**Field Based
Training
research**

**Training
Requirements**

**Training
Effectiveness
Techniques
&
Simulation
Technology**



Training Research & Development Testbeds



Collaboratory



- **Government, academia and industry partnership**
 - **Leveraging partner's funding and capabilities**
- **Industry and academia view lab as a shared testbed enabling them to try new technologies and methods**
- **Industry brings equipment, expertise and funding**



AF Agency Collaboration



- **AFRL/IFSA (Ms Jackie Smith)**
 - Command and Control embedded training
- **USAF Fighter Weapons School (Lt Col Corley)**
 - Development of spin-up syllabus
- **C2TIG (Col Dunleavy)**
 - Development of school house training and rehearsal for AOCs and IW flights
- **133 ACS (Lt Col Breitbach)**
 - Development of Modular Control Equipment (MCE) interface with Joint Semi-Automated Forces and DMT





Other Agency Collaboration



- **Air Intelligence Agency (AIA) (Mr. Tenney)**
 - Airborne Linguist training and rehearsal
 - Develop training and rehearsal technologies for Information Warfare and their Information Operations Center
- **Joint Strike Fighter (JSF) (Mr. Clare)**
 - Joint Operational Requirements Document (JORD) training requirements and training R&D
 - Evaluation of Joint Integrated Mission Model (JIMM)
- **Army Research Institute (Dr. Wightman)**
 - Low cost visual simulation technologies
- **Naval Air Warfare Center (Mr. Conley)**
 - Visual systems R&D (Marine Corps Aviation Simulation Master Plan)

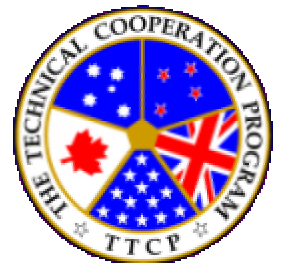




International Collaboration



- **Canadian Defense and Civil Institute of Environmental Medicine (DCIEM), (Dr. Lochlan Magee).**
 - Visual simulation technologies
 - Cockpit simulations, networking, threats, and brief/debrief technologies
- **NATO Research Technology Organization Studies, Analysis and Simulation Panel**
 - Mission Training Through Distributed Simulation (MTDS), concept development and demonstration task group
- **TTCP (UK/Canada)**
 - Investigate coalition training potential, from tactical through to the strategic level

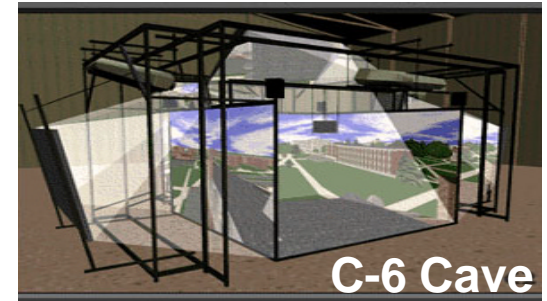
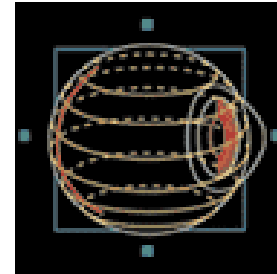




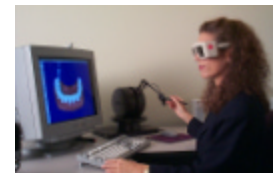
Academia Collaboration



- **Schepens Eye Research Institute (Dr. Peli)**
 - Behavioral research in vision, perception, and cognition
- **Iowa State University (Dr. Bernard)**
 - Virtual Reality Applications Center -- 6 (3-D) walls provide complete Immersion
 - Use of visualization as a training tool
- **Chandler Gilbert Community College (Ms. Graci)**
 - Virtual reality applications for air combat and maintenance training



Iowa State University





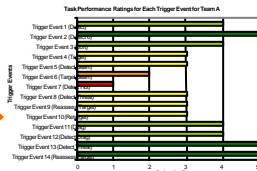
Small Business Innovation Research



Input Form

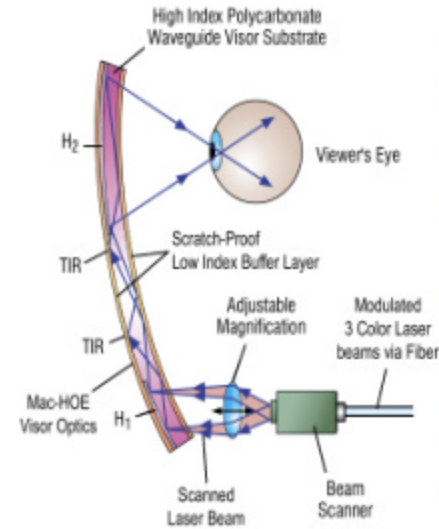


Results Immediately Available

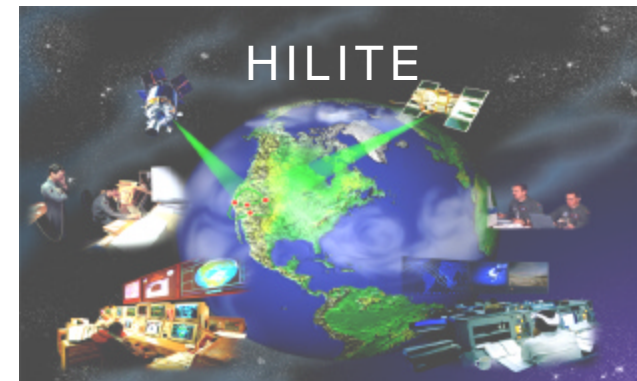


DMT Automated Performance Measurement System

- **Air Combat**
 - 2 Phase I
 - 3 Phase II
- **C2**
 - 2 Phase II
- **Space**
 - 8 Phase I
 - 1 Phase II
- **Force Protection**
 - 2 Phase II
- **Pervasive**
 - 4 Phase I
 - 1 Phase II



Light-weight, Holographic Visor Optic for Head-Mounted Displays



High Level Integrated Team Training Environment for Space



DMT for Force Protection



Future Opportunities



- **DMT expansion beyond Air to command and control, information warfare, Intelligence, Surveillance and Reconnaissance (ISR), force protection and ultimately other support areas**
- **Growing International Involvement**
NATO Canada United Kingdom Australia



Questions